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## Agrément Certificate

13/5065

Product Sheet 1

### ENVIROWALL EXTERNAL WALL INSULATION SYSTEM

### ENVIROWALL SYSTEM 2 EXTERNAL WALL INSULATION SYSTEM

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to the Envirowall System 2 External Wall Insulation System, comprising mechanically fixed enhanced expanded polystyrene (EPS) insulation boards, with supplementary adhesive where required, a reinforced basecoat and render or brick slip finishes. The system is suitable for use with height restrictions on the outside of external masonry walls in new or existing domestic and non-domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

#### CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production†
- formal three-yearly review.†

#### KEY FACTORS ASSESSED

**Thermal performance** — the system can be used to improve the thermal performance of external walls and can contribute to satisfying the requirements of the national Building Regulations (see section 6).

**Strength and stability** — the system can adequately resist wind loads and has sufficient resistance to impact damage. The resistance to impact will depend on the system chosen (see section 7).

**Behaviour in relation to fire** — the system has a B-s1, d0 reaction to fire classification in accordance with BS EN 13501-1: 2007 and its use is restricted. (see section 8).

**Risk of condensation** — the system can contribute to limiting the risk of interstitial and surface condensation (see section 11).

**Durability** — when installed and maintained in accordance with the Certificate holder's recommendations and the terms of this Certificate, the system will remain effective for at least 30 years. The durability can be extended to 60 years by using different fixings and supplementary adhesive (minimum 40%), and by following an inspection and maintenance programme (described in sections 12 and 13).



The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Hardy Giesler  
Chief Executive Officer

Date of Fifth issue: 14 May 2020

Originally certificated on 4 November 2013

Certificate amended on 18 September 2026 to update the accreditation status.

This Certificate is not issued under accreditation  
Readers MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.  
Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

#### British Board of Agrément

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## Regulations

In the opinion of the BBA, the Envirowall System 2 External Wall Insulation System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



### The Building Regulations 2010 (England and Wales) (as amended)

|                     |                                                                                                                                            |                                                                                      |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Requirement:</b> | <b>A1</b>                                                                                                                                  | <b>Loading</b>                                                                       |
| Comment:            | The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.13 of this Certificate.                        |                                                                                      |
| <b>Requirement:</b> | <b>B4(1)</b>                                                                                                                               | <b>External fire spread</b>                                                          |
| Comment:            | The system is restricted by this Requirement. See sections 8.1 to 8.4 of this Certificate.                                                 |                                                                                      |
| <b>Requirement:</b> | <b>C2(b)</b>                                                                                                                               | <b>Resistance to moisture</b>                                                        |
| Comment:            | The system can provide a degree of protection against rain ingress. See section 10.1 of this Certificate.                                  |                                                                                      |
| <b>Requirement:</b> | <b>C2(c)</b>                                                                                                                               | <b>Resistance to moisture</b>                                                        |
| Comment:            | The system can contribute to minimising the risk of interstitial and surface condensation. See sections 11.2 and 11.4 of this Certificate. |                                                                                      |
| <b>Requirement:</b> | <b>L1(a)(i)</b>                                                                                                                            | <b>Conservation of fuel and power</b>                                                |
| Comment:            | The system can contribute to satisfying this Requirement. See sections 6.1 and 6.2 of this Certificate.                                    |                                                                                      |
| <b>Regulation:</b>  | <b>7(1)</b>                                                                                                                                | <b>Materials and workmanship</b>                                                     |
| Comment:            | The system is acceptable. See sections 13.1 and 13.2 and the <i>Installation</i> part of this Certificate.                                 |                                                                                      |
| <b>Regulation:</b>  | <b>7(2)</b>                                                                                                                                | <b>Materials and workmanship</b>                                                     |
| Comment:            | The system is restricted by this Regulation. See sections 8.1 to 8.4 of this Certificate.                                                  |                                                                                      |
| <b>Regulation:</b>  | <b>26</b>                                                                                                                                  | <b>CO<sub>2</sub> emission rates for new buildings</b>                               |
| <b>Regulation:</b>  | <b>26A</b>                                                                                                                                 | <b>Fabric energy efficiency rates for new dwellings (applicable to England only)</b> |
| <b>Regulation:</b>  | <b>26A</b>                                                                                                                                 | <b>Primary energy consumption rates for new buildings (applicable to Wales only)</b> |
| <b>Regulation:</b>  | <b>26B</b>                                                                                                                                 | <b>Fabric performance values for new dwellings (applicable to Wales only)</b>        |
| Comment:            | The system can contribute to satisfying these Regulations. See sections 6.1 and 6.2 of this Certificate.                                   |                                                                                      |



### The Building (Scotland) Regulations 2004 (as amended)

|                    |                                                                                                                                                                                                          |                                                         |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| <b>Regulation:</b> | <b>8(1)(2)</b>                                                                                                                                                                                           | <b>Durability, workmanship and fitness of materials</b> |
| Comment:           | The system can contribute to a construction satisfying this Regulation. See sections 12, 13.1 and 13.2 and the <i>Installation</i> part of this Certificate.                                             |                                                         |
| <b>Regulation:</b> | <b>9</b>                                                                                                                                                                                                 | <b>Building standards applicable to construction</b>    |
| Standard:          | <b>1.1</b>                                                                                                                                                                                               | <b>Structure</b>                                        |
| Comment:           | The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.13 of this Certificate.                                                                                      |                                                         |
| Standard:          | <b>2.6</b>                                                                                                                                                                                               | <b>Spread to neighbouring buildings</b>                 |
| Comment:           | The system is restricted by this Standard, with reference to clauses 2.6.4 <sup>(1)(2)</sup> , 2.6.5 <sup>(1)</sup> and 2.6.6 <sup>(2)</sup> . See sections 8.1 to 8.3, 8.5 and 8.6 of this Certificate. |                                                         |

|                                                                                      |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard:                                                                            | 2.7       | Spread on external walls                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Comment:                                                                             |           | The system is restricted by this Standard and is acceptable with reference to clause 2.7.1 <sup>(1)(2)</sup> . See sections 8.1 to 8.3, 8.5 and 8.6 of this Certificate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Standard:                                                                            | 3.10      | Precipitation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Comment:                                                                             |           | The system will contribute to satisfying this Standard, with reference to clauses 3.10.1 <sup>(1)(2)</sup> and 3.10.2 <sup>(1)(2)</sup> . See section 10.1 of this Certificate.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Standard:                                                                            | 3.15      | Condensation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Comment:                                                                             |           | The system can contribute to satisfying this Standard, with reference to clauses 3.15.1 <sup>(1)(2)</sup> , 3.15.4 <sup>(1)(2)</sup> and 3.15.5 <sup>(1)(2)</sup> . See sections 11.3 and 11.4 of this Certificate.                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Standard:                                                                            | 6.1(b)    | Carbon dioxide emissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Standard:                                                                            | 6.2       | Building insulation envelope                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Comment:                                                                             |           | The system can contribute to satisfying these Standards, with reference to clauses (or parts of) 6.1.1 <sup>(1)</sup> , 6.1.2 <sup>(1)(2)</sup> , 6.1.3 <sup>(1)(2)</sup> , 6.1.4 <sup>(2)</sup> , 6.1.6 <sup>(1)</sup> , 6.1.8 <sup>(2)</sup> , 6.1.10 <sup>(2)</sup> , 6.2.1 <sup>(1)(2)</sup> , 6.2.3 <sup>(1)</sup> , 6.2.4 <sup>(1)</sup> , 6.2.5 <sup>(1)(2)</sup> , 6.2.6 <sup>(2)</sup> , 6.2.7 <sup>(2)</sup> , 6.2.11 <sup>(1)</sup> and 6.2.13 <sup>(2)</sup> . See sections 6.1 and 6.2 of this Certificate.                                                                                                                    |
| Standard:                                                                            | 7.1(a)(b) | Statement of sustainability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Comment:                                                                             |           | The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting the bronze level of sustainability as defined in this Standard. In addition, the system can contribute to a construction meeting a higher level of sustainability as defined in this Standard with reference to clauses 7.1.4 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ], 7.1.6 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ] and 7.1.7 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> ]. See section 6.1 of this Certificate. |
| Regulation:                                                                          | 12        | <b>Building standards applicable to conversions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Comment:                                                                             |           | All comments given for the system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> .                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p>(1) Technical Handbook (Domestic).<br/>(2) Technical Handbook (Non-Domestic).</p> |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |



## The Building Regulations (Northern Ireland) 2012 (as amended)

|             |          |                                                                                                                        |
|-------------|----------|------------------------------------------------------------------------------------------------------------------------|
| Regulation: | 23       | <b>Fitness of materials and workmanship</b>                                                                            |
| Comment:    |          | The system is acceptable. See sections 13.1 and 13.2 and the <i>Installation</i> part of this Certificate.             |
| Regulation: | 28(b)    | <b>Resistance to moisture and weather</b>                                                                              |
| Comment:    |          | The system provides a degree of protection against rain ingress. See section 10.1 of this Certificate.                 |
| Regulation: | 29       | <b>Condensation</b>                                                                                                    |
| Comment:    |          | Walls insulated with the system can satisfy the requirements of this Regulation. See section 11.4 of this Certificate. |
| Regulation: | 30       | <b>Stability</b>                                                                                                       |
| Comment:    |          | The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.13 of this Certificate.    |
| Regulation: | 36(a)    | <b>External fire spread</b>                                                                                            |
| Comment:    |          | The system is restricted by this Regulation. See sections 8.1 to 8.4 of this Certificate.                              |
| Regulation: | 39(a)(i) | <b>Conservation measures</b>                                                                                           |
| Regulation: | 40       | <b>Target carbon dioxide emission rate</b>                                                                             |
| Comment:    |          | The system can contribute to satisfying these Regulations. See sections 6.1 and 6.2 of this Certificate.               |

# Construction (Design and Management) Regulations 2015

## Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.1 and 3.3) and 12 *Maintenance and repair* of this Certificate.

### Additional Information

#### NHBC Standards 2020

In the opinion of the BBA, the Envirowall System 2 External Wall Insulation System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards<sup>(1)</sup> 2020*, Part 6 *Superstructure (excluding roof)* and Chapter 6.9 *Curtain Walling and Cladding*.

(1) There is a general requirement in *NHBC Standards* Chapter 6.9 for fire-retardant-treated EPS insulation to be used with this system in accordance with BS EN 13163 : 2012.

### Technical Specification

#### 1 Description

1.1 The Envirowall System 2 External Wall Insulation System consists of enhanced expanded polystyrene (EPS) insulation boards mechanically fixed to the substrate wall, with supplementary adhesive<sup>(1)</sup> where required (with a minimum of 40% coverage of adhesive), with reinforced glass fibre mesh embedded in the basecoat, primer if required and finishes (see Table 1 and Figure 1).

(1) supplementary adhesive is compulsory for the 60 years durability system

*Table 1 Options of Envirowall System 2 External Wall Insulation System*

| Components                            | Option 1                                             | Option 2                                              | Option 3                       | Option 4    |
|---------------------------------------|------------------------------------------------------|-------------------------------------------------------|--------------------------------|-------------|
| Supplementary adhesive <sup>(1)</sup> |                                                      | EnviroBed                                             |                                |             |
| Insulation                            |                                                      | Grey EPS 70 grey (90 to 200 mm)                       |                                |             |
| Basecoat                              |                                                      | RetroBase                                             |                                |             |
| Reinforcement                         |                                                      | EnviroMesh                                            |                                |             |
| Primer                                |                                                      | silicone acrylate primer                              |                                |             |
| Finishes                              | SpeedySlip<br>adhesive<br>mortar<br>+<br>SpeedySlips | EnviroDash<br>receiver<br>+<br>dry dash<br>aggregates | silicone<br>acrylate<br>render | Envirobrick |

(1) Supplementary adhesive is not required for the allowable dry fix configuration.

1.2 The system can be designed to achieve either a 30- or 60-year service life (see Figure 1). Mechanical fixings are applied through the insulation boards for a 30-year system, or through the reinforcement mesh and insulation boards for the 30- or 60-year system, to the external surface of the substrate wall. See sections 1.3 and 1.4 for more information.

1.3 The system combinations, by method of fixings, covered under this Certificate include:

- All system combinations that are mechanically fixed through the insulation only (that is, not through the mesh and insulation) and use supplementary adhesive (minimum of 40%) – 30 years durability systems only
- All system combinations that are mechanically fixed through mesh/insulation and use supplementary adhesive (minimum 40%)
- Dry-fixed system, 30-year durability system only; the permissible insulation thicknesses are shown below, along with the finishes. The system may be fixed through the insulation only or through the mesh/insulation:

- 90 to 135 mm thickness for EnviroDash receiver and dry dash aggregate finish
- 90 to 200 mm thickness for EnviroBrick render finish
- 90 to 200 mm thickness for SpeedySlip adhesive and SpeedySlips
- 90 to 200 mm thickness for silicone acrylate render finish.

### 30-year durability

1.4 After the boards have been secured to the wall with insulation adhesive and rasped flat, mechanical fixings are installed through the insulation, followed by the basecoat (trowel-applied to the specified thickness) and reinforcement mesh, which is fully embedded within the basecoat. The system is left to cure before application of the primer, finish and decorative coats.

### 60-year durability

1.5 After the boards have been secured to the wall with insulation adhesive and rasped flat, the basecoat is trowel-applied to the specified thickness, followed by the reinforcement mesh, which is fully embedded within the basecoat. While the basecoat is still wet, mechanical fixings are applied through the mesh and insulation boards into the substrate, followed by the application of mesh patches over the fixing heads, with more basecoat applied to fully embed the fixing plate and the mesh patches. Additional basecoat is applied to achieve the required thickness, measured from the top of the fixing plate. The system is left to cure before application of the primer, finish and decorative coats.

1.6 Additionally, for the 60-year durability system, the requirements of sections 1.7 (*Mechanical fixings*), 4.13 and 4.14 must be satisfied.

1.7 The system comprises the following components:

#### Adhesive (supplementary)

- EnviroBed — polymer-modified, grey cementitious powder of limestone aggregate and specially selected fillers, to which water is added (one litre per 5 kg powder, mixed for 5 minutes, allowed to stand for 5 minutes then re-mixed). Applied to an overall thickness of 10 mm, with a coverage of 4 to 5 kg.m<sup>-2</sup>.

#### Insulation<sup>(1)(2)</sup>

- Enhanced expanded polystyrene (EPS 70 Grey) boards — 1200 by 600 mm, in a range of thicknesses between 90<sup>(2)</sup> and 200 mm in increments of 10 mm, with a nominal density of 15 kg.m<sup>-3</sup>, a minimum compressive strength of 70 kN.m<sup>-2</sup> and a minimum tensile strength perpendicular to the faces of 100 kN.m<sup>-2</sup>. Boards are manufactured to comply with the requirements of BS EN 13163 : 2012.

(1) For declared thermal conductivity values ( $\lambda_D$ ), see Table 3.

(2) Insulation thicknesses below 90 mm would generally be used on reveals.

#### Mechanical fixings

- mechanical fixings<sup>(1)(2)</sup> — proprietary external wall insulation fixings of adequate length to suit the substrate and insulation thickness and supplied by the Certificate holder:
  - Koelner KI-10<sup>(3)(4)</sup>: polypropylene anchor sleeve with a carbon steel, galvanized steel or glass fibre-reinforced polypropylene pin
  - Koelner T FIX 8M<sup>(3)(4)</sup>: polypropylene anchor sleeve with a carbon steel, galvanized steel or glass fibre-reinforced polyamide pin
  - Ejotharm NT U<sup>(2)(4)</sup>: high density polyethylene anchor sleeve, with either a galvanized steel or stainless steel pin
  - Ejotharm STR U<sup>(2)(4)</sup>: high density polyethylene anchor sleeve, with either a galvanized steel or stainless steel pin.

(1) Other fixings may be used provided they can be demonstrated to have equal or higher pull-out, plate diameter and plate stiffness characteristics

(2) High density polyethylene or polyamide anchor sleeve with a stainless steel pin is required to achieve 60-year durability performance

(3) These fixings can only be specified for 30-year durability applications.

(4) Any of the fixings listed here can be used for dry fix applications.

## **Basecoats**

- RetroBase — polymer-modified, grey cementitious powder of limestone aggregate and specially selected fillers, to which water is added (one litre per 5 kg powder, mixed for 5 minutes, allowed to stand for 5 minutes then re-mixed). Applied to a thickness of 5 mm, and coverage rate of  $1.8 \text{ kg}\cdot\text{m}^{-2}$ .

## **Reinforcement**

- EnviroMesh — an alkali-resistant glass fibre mesh, with a 4 by 4 mm grid size and nominal weight of  $165 \text{ g}\cdot\text{m}^{-2}$ .

## **Primers**

- Silicone acrylate primer — ready to use primer, available in various colours, to be used with the silicone acrylate render and applied at a coverage rate of  $0.2$  to  $0.3 \text{ kg}\cdot\text{m}^{-2}$

## **Acrylate render finish**

- Silicone acrylate render — supplied pre-mixed in a range of colours. With particle sizes 1.5 to 3 mm and thickness dictated by particle size, with a coverage rate of  $2.3 \text{ kg}\cdot\text{m}^{-2}$ .

## **Brick render finish**

- EnviroBrick render — polymer-modified, cementitious, self-coloured render, requiring the addition of water. It is applied in two different coloured coats, the topcoat then being cut through to expose the mortar layer, creating a brick or stone effect. The mortar layer is applied to a 6 to 8 mm thickness (approximately), with the face layer applied to a 3 to 5 mm thickness (approximately). No primer is required with this render finish.

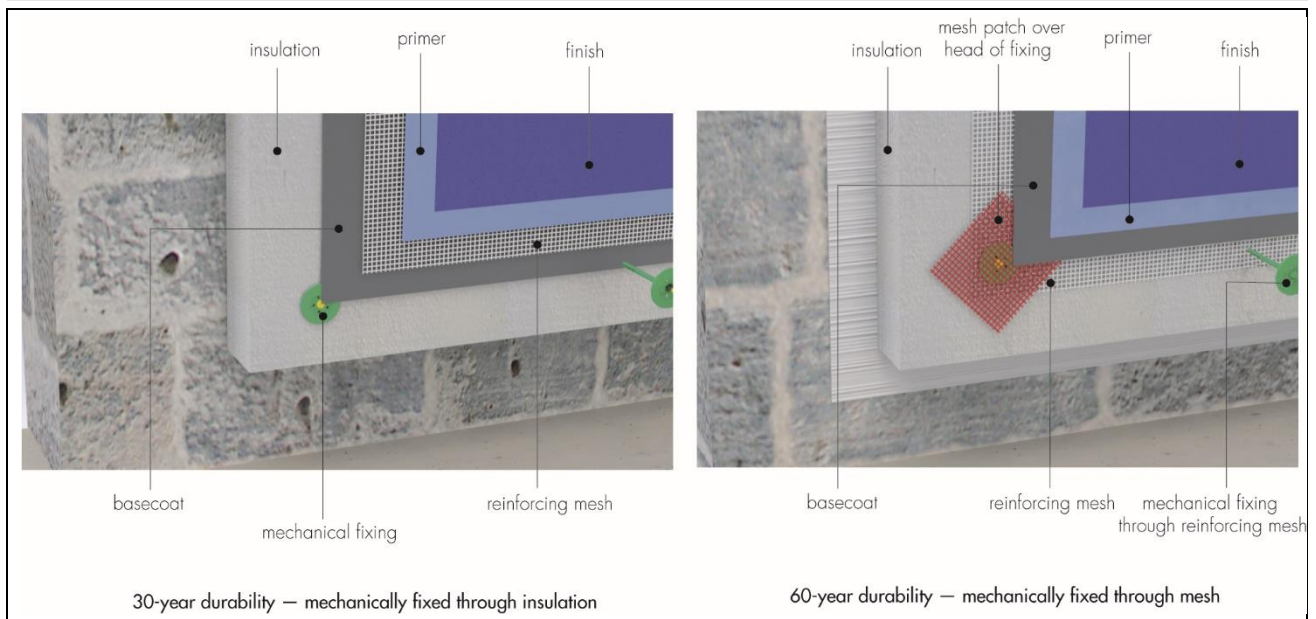
## **Dash aggregate finish**

- EnviroDash — polymer-modified, cementitious dash receiver render. Supplied in powder form to which clean water is added at a rate of approximately 4.75 litres per 25 kg, applied to a 4 to 6 mm thickness at a coverage rate of 6 to 8 mm
- Dry dash — aggregates up to 8 mm and available in a range of colours (aggregates in accordance with BS EN 13139 : 2002) Applied at a coverage rate of approximately  $9 \text{ kg}\cdot\text{m}^{-2}$

## **Brickslip finish**

- SpeedySlip adhesive mortar — an organically bound, water-based, cement-free ready to use mortar, with a density of  $1.70 \text{ g}\cdot\text{cm}^{-3}$ . Supplied in a range of colours and applied to an approximate thickness of 3 mm at a coverage rate of  $3.5 \text{ kg}\cdot\text{m}^{-2}$
- SpeedySlips — 65 by 215 mm simulated brick-slips, 4 to 6 mm thick, comprising inorganic fillers and aggregates with an organic binder, applied at a coverage of  $2.5$  to  $3.4 \text{ kg}\cdot\text{m}^{-2}$ . Also available in corner profiles, 65 by 215 by 115 mm

**Figure 1 Envirowall System 2 External Wall Insulation System**



1.8 Ancillary materials used with the system are:

- a range of aluminium, PVC-U or stainless steel profiles<sup>(1)</sup>, comprising:
  - base profile
  - edge profile
  - corner profile with optional PVC-U nosing
  - render stop profile.

(1) For 60-year durability systems, these profiles must be made of stainless steel (see section 13.2).

1.9 Ancillary materials also used with the system, but which are outside the scope of this Certificate, are:

- aluminium, PVC-U or stainless steel profiles<sup>(1)</sup>, comprising:
  - movement joint
  - expansion joint

(1) For 60-year durability systems, these profiles must be made of stainless steel (see section 13.2).

- profile connectors and fixings
- fungicidal wash
- extension profile
- sealants — silicone in accordance with BS EN ISO 11600 : 2003
- expansion foam — polyurethane foam, used for filling gaps between insulation boards.

## 2 Manufacture

2.1 The system components are either manufactured by the Certificate holder or bought-in from suppliers, to an agreed specification.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of SPS Envirowall Limited has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 and BS EN ISO 14001 : 2015 by CQS (Certified Quality Systems) Limited (Certificate SP240367 and SP240368 respectively).

### 3 Delivery and site handling

3.1 Each package carries the product identification, manufacturer's batch number and the BBA logo incorporating the number of this Certificate. The components are delivered to site in the packaging and quantities listed in Table 2.

*Table 2 Component supply details*

| Component                                       | Quantity/packaging        |
|-------------------------------------------------|---------------------------|
| Insulation                                      | sealed packs              |
| EnviroBed (adhesive)                            | 25 kg bags                |
| RetroBase (basecoat)                            | 25 kg bags                |
| EnviroMesh                                      | 50 by 1 m rolls           |
| Silicone acrylate primer                        | 20 kg buckets             |
| SpeedySlips adhesive mortar                     | 20 kg buckets             |
| SpeedySlips                                     | 174 per boxes             |
| EnviroBrick render                              | 25 kg bags                |
| Silicone acrylate render                        | 25 kg buckets             |
| EnviroDash receiver                             | 25 kg bags                |
| Dry dash                                        | 25 kg bags                |
| Mechanical fixings                              | boxed by the manufacturer |
| Base, edge, corner and render stop end profiles | lengths of 2500 mm        |

3.2 The insulation must be stored on a firm, clean, level base, off the ground and under cover until required for use. Care must be taken when handling to avoid damage.

3.3 The insulation must be protected from prolonged exposure to sunlight, either by storing opened packs under cover or re-covering with opaque polythene sheeting. Care must be taken to avoid the insulation coming into contact with solvents or materials containing volatile organic components. The boards must not be exposed to open flame or other ignition sources. Boards that become damaged, soiled or wet should be discarded.

3.4 The adhesive, basecoat and topcoats and all cementitious materials must be stored in dry conditions within 5 and 30°C, off the ground and protected from moisture. Contaminated material must be discarded.

3.5 The other components should be stored in a safe area, under cover and protected from excessive heat and frost at all times.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Envirowall System 2 External Wall Insulation System.

## Design Considerations

### 4 General

4.1 The Envirowall System 2 External Wall Insulation System, when installed in accordance with this Certificate, is satisfactory for use in reducing the thermal transmittance (U value) of external masonry or concrete walls of new and existing buildings. It is essential that the detailing techniques specified in this Certificate are carried out to a high standard if the ingress of water into the insulation is to be avoided and the full thermal benefit obtained from treatment with the system (eg the insulation must be protected by an overhang, and window sills should be designed and installed so as to direct water away from the building).

4.2 For improved thermal/carbon-emissions performance of the structure, the designer should consider additional/alternative fabric and/or services measures.

4.3 The system is for application to the outside of external walls of masonry, normal weight concrete, lightweight concrete, autoclaved concrete and no-fines concrete construction, on new or existing domestic and non-domestic buildings (with or without existing render) up to 18 m in height in England, Wales and Northern Ireland, and with no storey more than 11 m above the ground in Scotland. Prior to the installation of the system, wall surfaces should comply with section 14 of this Certificate.

4.4 New walls subject to national Building Regulations should be constructed in accordance with the relevant recommendations of:

- BS EN 1992-1-1 : 2004 and its UK National Annex
- BS EN 1996-1-1 : 2005 and its UK National Annex
- BS EN 1996-2 : 2006 and its UK National Annex
- BS 8000-0 : 2014
- BS 8000-2.2 : 1990
- BS 8000-3 : 2001.

4.5 New walls not subject to regulatory requirements should also be built in accordance with the Standards identified in section 4.4 of this Certificate.

4.6 Movement joints should be incorporated into the system in line with existing movement joints in the building structure and in accordance with the Certificate holder's recommendations for the specific installation.

4.7 The system will improve the weather resistance of a wall and provide a decorative finish. However, for existing buildings, it should only be installed where there are no signs of dampness on the inner surface of the wall other than those caused solely by condensation.

4.8 The effect of the system on the acoustic performance of a construction is outside the scope of this Certificate.

4.9 The fixing of sanitary pipework, plumbing, rainwater goods, satellite dishes, clothes lines, hanging baskets and similar items to the system is outside the scope of this Certificate. See section 4.10 of this Certificate.

4.10 External pipework and ducts should be removed before installation, and alterations made to underground drainage to accommodate repositioning of the pipework to the finished face of the system. The Certificate holder may advise on suitable fixing methods, but these are outside the scope of this Certificate.

4.11 The designer should select a construction appropriate to the local wind-driven rain index, paying due regard to the design detailing, workmanship and materials to be used.

4.12 It is essential that this system is installed and maintained in accordance with the conditions set out in this Certificate.

4.13 The Envirowall System 2 External Wall Insulation System can be adapted to achieve an extended service life of 60 years instead of the standard 30. The difference between the 30- and 60-year durability system is covered in sections 1.2 to 1.5, with the detailed installation procedures covered in section 16.

4.14 For a 60-year durability system, the following components must be constructed from stainless steel grade 1.4301 or 1.4401 to BS EN 10088-2 : 2014

- base profile and render stop end including the fixings. In addition, any other profile component which would remain exposed after the application of the finish coat
- corner profile (if exposed after application of the system)
- pin or screw for mechanical fixings.

## 5 Practicability of installation

The system must only be installed by specialised contractors who have successfully undergone training and registration by the Certificate holder (see section 15).

Note: The BBA operates a UKAS-accredited Approved Installer Scheme for external wall insulation (non-mandatory); details of approved installer companies are included on the BBA website ([www.bbacerts.co.uk](http://www.bbacerts.co.uk)).

## 6 Thermal performance



6.1 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2017 and BRE Report BR 443 : 2006, using the insulation manufacturer's declared thermal conductivity ( $\lambda_D$  value) of  $0.032 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ .

6.2 The U value of a completed wall will depend on the selected insulation thickness and fixing method, the insulation value of the substrate masonry and its internal finish. Figures for typical design U values, calculated in accordance with section 6.1, are given in Tables 3 and 4.

**Table 3 Insulation thickness required to achieve U value<sup>(1)(2)(3)</sup> using galvanized steel fixings (30-year durability)**

| U value ( $\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ ) | Thickness of insulation <sup>(3)</sup> (mm) EPS 70 Grey                             |                                                                                           |
|------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
|                                                            | 215 mm brickwork ( $\lambda = 0.56 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) | 200 mm dense blockwork ( $\lambda = 1.75 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) |
| 0.18                                                       | 190                                                                                 | 200                                                                                       |
| 0.19                                                       | 180                                                                                 | 190                                                                                       |
| 0.25                                                       | 130                                                                                 | 140                                                                                       |
| 0.26                                                       | 120                                                                                 | 130                                                                                       |
| 0.28                                                       | 110                                                                                 | 120                                                                                       |
| 0.30                                                       | 100                                                                                 | 110                                                                                       |
| 0.35                                                       | 90                                                                                  | 90                                                                                        |

- (1) Wall construction inclusive of 13 mm plaster ( $\lambda = 0.57 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) and 5 mm render ( $\lambda = 1.0 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ), brickwork (protected) with 17.1 % mortar ( $\lambda = 0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ). Declared thermal conductivity ( $\lambda_D$ ) of insulation is as shown in 6.1
- (2) Calculation based on a system that included 7 galvanized steel fixings per square metre, with 8 mm diameter sleeve and a point thermal transmittance ( $X_p$ ) of  $0.004 \text{ W}\cdot\text{K}^{-1}$  per  $\text{m}^2$ . Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2017
- (3) Based upon incremental insulation thickness of 10 mm.

**Table 4 Insulation thickness required to achieve U value<sup>(1)(2)(3)(4)</sup> using stainless steel fixings (60-year durability)**

| U value ( $\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ ) | Thickness of insulation <sup>(3)</sup> (mm) EPS 70 Grey                             |                                                                                           |
|------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
|                                                            | 215 mm brickwork ( $\lambda = 0.56 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) | 200 mm dense blockwork ( $\lambda = 1.75 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) |
| 0.18                                                       | 170                                                                                 | 180                                                                                       |
| 0.19                                                       | 160                                                                                 | 170                                                                                       |
| 0.25                                                       | 120                                                                                 | 130                                                                                       |
| 0.26                                                       | 110                                                                                 | 120                                                                                       |
| 0.28                                                       | 110                                                                                 | 110                                                                                       |
| 0.30                                                       | 100                                                                                 | 100                                                                                       |
| 0.35                                                       | 90                                                                                  | 90                                                                                        |

- (1) Wall construction inclusive of 13 mm plaster ( $\lambda = 0.57 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) and 14 mm render ( $\lambda = 1.0 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ), brickwork (protected) with 17.1 % mortar or dense blockwork with 6.7% mortar ( $\lambda = 0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ). Declared thermal conductivity ( $\lambda_D$ ) of insulation is as shown in 6.1
- (2) Calculation based on a system that included 7 stainless steel fixings per square metre, with 8 mm diameter sleeve and a point thermal transmittance ( $X_p$ ) of  $0.002 \text{ W}\cdot\text{K}^{-1}$  per  $\text{m}^2$ . Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2017
- (3) Based upon incremental insulation thickness of 10 mm
- (4) When applying the maximum available insulation thickness, these walls can achieve a U value of  $0.16 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ .

6.3 Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration. Detailed guidance can be found in the documents supporting the National Building Regulations.

## 7 Strength and stability

### General



7.1 The Certificate holder is ultimately responsible for the design of the system and it is the responsibility of the company installing the system to accurately follow the installation instructions (see also section 5 of this Certificate). The Certificate holder must also verify that a suitably experienced and qualified individual (with adequate professional indemnity) establishes that:

- the wind loads on the different zones of the building's elevation for the specific geographical location have been calculated correctly (see section 7.3)
- the system can adequately resist and safely transfer the calculated loads, accounting for all possible failure modes, to the substrate wall and supporting structure (see sections 7.3 to 7.6).

7.2 The substrate and supporting structure must be capable of transferring all additional loading due to the installation of the system to the ground in a satisfactory manner. The adequacy of the substrate and supporting structure must be verified by the person or party responsible for the global stability of the building to which the system is applied. Any defects should be made good prior to the system being installed.

7.3 The wind loads on the walls should be calculated, taking into account all relevant factors such as location and topography, in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. All of the factors affecting wind load on each elevation and specific zones of the building must be considered. In accordance with BS EN 1990 : 2002 and its UK National Annex, a partial factor of 1.5 must be applied to the calculated characteristic wind pressure values to establish the design wind load to be resisted by the system.

7.4 Installations correctly designed in accordance with this Certificate will safely accommodate the applied loads due to the self-weight of the system, wind and impact.

7.5 Positive wind load is transferred to the substrate wall directly via compression through the render and insulation system.

7.6 Negative wind load is transferred to the substrate wall via<sup>(1)(2)</sup>:

- the bond between the insulation and render system (see section 7.7)
- the pull-out resistance of the fixing from the substrate wall (see section 7.8)
- the pull-through resistance of the fixing (see section 7.9).

(1) For mechanically fixed systems with supplementary adhesive, the contribution of the adhesive is not considered when calculating resistance to wind load

(2) Further guidance is available from BBA Guidance Note 1, available on the BBA website ([www.bbacerts.co.uk](http://www.bbacerts.co.uk)).

7.7 The characteristic bond resistance between the insulation and render interface derived from test results was  $80 \text{ kN}\cdot\text{m}^{-2}$ . The design resistance of the bond between the insulation and render ( $N_{RD1}$ ) should be taken as the characteristic bond resistance divided by a partial factor of 9.

7.8 Typical characteristic pull-out resistances for the fixings taken from the corresponding European Technical Assessment (ETA) are given in Table 5; the values are dependent on the fixing type and must be selected to suit the specific loads and substrate concerned. In situations where suitable data does not exist<sup>(1)</sup>, the characteristic pull-out resistance must be established from site-specific pull-out tests conducted on the substrate of the building to ascertain the minimum resistance to pull-out failure of the fixings, and determined in accordance with the guidance given in EOTA TR051 (minimum test characteristic value =  $0.6 \times$  mean of 5 lowest test results). To obtain the design pull-out resistance of the fixings ( $N_{RD2}$ ), this characteristic pull-out resistance should then be divided by the partial factor given in Table 5.

(1) To qualify as suitable data, the age and condition of the substrate must be equivalent to that used to establish the values in the ETA.

**Table 5 Fixings – typical characteristic pull-out strengths**

| Fixing type <sup>(1)</sup> | ETA number | Substrates                        | Drill diameter (mm) | Effective anchorage depth (mm) | Characteristic pull-out resistance (kN) <sup>(2)</sup> | Partial factor |
|----------------------------|------------|-----------------------------------|---------------------|--------------------------------|--------------------------------------------------------|----------------|
| Koelner KI-10              | 07/0291    | Concrete C12/15<br>Clay brickwork | 10                  | 25                             | 0.5                                                    | 2              |
| Koelner TFIX-8M            | 07/0336    | Concrete C12/15<br>Clay brickwork | 8                   | 25                             | 1.2                                                    | 2              |
| Ejotherm NT U              | 05/0009    | Concrete C12/15<br>Clay brickwork | 8                   | 25                             | 1.2<br>1.5                                             | 2              |
| Ejotherm STR U             | 04/0023    | Concrete C12/15<br>Clay brickwork | 8                   | 25                             | 1.5                                                    | 2              |

(1) The minimum values for plate stiffness of fixings is 0.4 kN·mm<sup>-2</sup> and the load resistance is 2.08 kN

(2) Values are determined in accordance with EAD 330196-01-0604 : 2016 and are dependent on the substrate. The use categories are defined in the corresponding ETA.

7.9 The characteristic pull-through resistance of the fixings was determined from tests using a 60 mm diameter fixing plate and minimum insulation thickness of 90 mm. The design resistance per fixing ( $N_{RD3}$ ) is obtained by applying an appropriate partial factor as shown in Table 6.

**Table 6 Design pull-through resistances**

| Factor (unit)                                                                                   | Grey EPS insulation 1200 x 600 mm<br>Pull-through data for 30- and 60-year<br>durability system |      |
|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------|
|                                                                                                 |                                                                                                 |      |
| Tensile resistance of the insulation (kN·m <sup>-2</sup> )                                      | ≥ 100                                                                                           |      |
| Fixing type <sup>(1)</sup>                                                                      | Koelner KI-10/120                                                                               |      |
| Fixing plate diameter (mm)                                                                      | 60                                                                                              |      |
| Insulation thickness (mm)                                                                       | ≥ 90                                                                                            |      |
| Characteristic pull-through resistance <sup>(2)</sup> per fixing (KN)                           | 1.35                                                                                            |      |
| Partial factor <sup>(3)</sup>                                                                   | 2.5                                                                                             |      |
| Design pull-through resistance per fixing ( $N_{RD3}$ ) kN                                      | At panel                                                                                        | 0.54 |
| Design pull-through resistance per board kN (based on minimum number of fixings) <sup>(4)</sup> | 2.7                                                                                             |      |
| Design pull-through resistance per board kN (based on maximum number of fixings) <sup>(5)</sup> | 3.24                                                                                            |      |

(1) See Table 5 for typical characteristic pull-out resistance of the fixings

(2) Characteristic pull-through resistance of insulation over the head of the fixing, in accordance with BS EN 1990 : 2002, Annex D7.2 and its UK National Annex

(3) The partial factor is based on the assumption that all insulation boards are quality controlled and tested to establish tensile strength perpendicular to the face of the board

(4) The minimum design pull through resistance per board is based on a minimum of 5 fixings per board (1200 x 600 mm), which equates to approximately 7 fixings per m<sup>2</sup>. The design resistance for the minimum number of fixings is based on the layout provided in Figure 6. Layout and interaction of the fixings should be considered when calculating the design resistance per board

(5) The maximum design pull through resistance per board is based on a maximum of 6 fixings per board (1200 x 600 mm), which equates to approximately 8 fixings per m<sup>2</sup>. The design resistance for the maximum number of fixings is only applicable for the insulation thickness tested and as specified in this Table. Layout and interaction of the fixings should be considered when calculating the design resistance per board.

7.10 The number and spacing of the fixings should be determined by the Certificate holder. The number of fixings must not be less than the minimum specified for the system, and the fixings should be symmetrically positioned and evenly distributed about the centre of the board both vertically and horizontally except at openings and building corners.

7.11 Dry fix installations correctly designed in accordance with this Certificate will safely accommodate the applied loads due to the self-weight of the system, wind and impact when using insulation with a maximum thickness as per section 1.3 of the Certificate, any render system and fixings as per section 1.7 of the Certificate. Seals and interfaces with the render system should be designed and detailed to accommodate this movement.

7.12 The data obtained from sections 7.7, 7.8 and 7.9 must be assessed against the design wind load and the following expression must be satisfied:

For safe design:

$$R_d \geq W_e$$

$$R_{d,b.ins/render} = A_r * N_{RD1}$$

$$R_{d,pull-out} = n * N_{RD2}$$

$$R_{d,pull-through} = (N_{RD3panel} * n_{panel}) + (N_{RD3joint} * n_{joint}) / A_{board}$$

Where:

$R_d$  is the design ultimate resistance ( $kN \cdot m^{-2}$ ) taken as the minimum of  $R_{d,b.ins/render}$ ,  $R_{d,pull-out}$  and  $R_{d,pull-through}$

$W_e$  is the maximum design wind load ( $kN \cdot m^{-2}$ )

$R_{d,b.ins/render}$  is the design bond resistance between the insulation and render ( $kN \cdot m^{-2}$ )

$R_{d,pull-out}$  is the design pull-out resistance of the insulation fixings per metre square ( $kN \cdot m^{-2}$ )

$R_{d,pull-through}$  is the design pull-through resistance of the insulation fixings per metre square ( $kN \cdot m^{-2}$ )

$A_r$  is the reinforced basecoat bond area (based on % area covered)

$N_{RD1}$  is the design adhesive bond resistance between the insulation and render, based on test ( $kN \cdot m^{-2}$ )

$n$  is the number of anchor fixings per  $m^2$

$N_{RD2}$  is the design pull-out resistance per fixing based on test (kN)

$N_{RD3panel}$  is the design pull-through resistance per anchor not placed at the panel joint, based on test (kN)

$N_{RD3joint}$  is the design pull-through resistance per anchor placed at the panel joint, based on test (kN)

$n_{panel}$  is the number of internal anchors in a panel

$n_{joint}$  is the number of joint anchors in a panel

$A_{board}$  is the area of the board ( $m^2$ )

7.13 The insulation system is mechanically fixed to the substrate wall with a minimum of 5 fixings per board or approximately 7 fixings per square metre, as per the fixing pattern shown in Figure 6 and in conjunction with a minimum 40% coverage of supplementary adhesive (see section 16 of this Certificate). Additional fixings may be required, depending on the results of the calculations detailed above for the specific site.

## Impact resistance

7.14 Hard body impact tests were carried out in accordance with ETAG 004 : 2013. The system is suitable for use in the Categories up to and including those specified in Table 7 of this Certificate.

Table 7 System impact resistance

| Render systems:                                                  | Use Category <sup>(1)</sup> |
|------------------------------------------------------------------|-----------------------------|
| Basecoat (+ primer + finishing coats which are indicated below): | Single mesh                 |
| EnviroDash + Dry dash                                            | Category II                 |
| Silicone acrylate render (both primer and finish)                | Category III                |
| EnviroBrick render                                               | Category II                 |
| SpeedySlip adhesive + SpeedySlips                                | Category II                 |

(1) The Use Categories are defined in ETAG 004 : 2013 as:

- Category I — a zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use
- Category II — a zone liable to impacts from thrown or kicked objects, but in public locations where the height of the system will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care
- Category III — a zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.

## 8 Behaviour in relation to fire



8.1 The system can have a fire classification of B-s1, d0<sup>(1)</sup> in accordance with BS EN 13501-1: 2007.

(1) Exova Test Report 350361.

8.2 The classification applies to the full range of thicknesses covered by the Certificate and the colour 'blue'. The classifications for other colours should be confirmed by reference to the documents supporting the national Building Regulations.

8.3 The insulation materials in isolation is not classified as 'non-combustible' or 'of limited combustibility'.



8.4 In England, Wales and Northern Ireland the system is not classified as ‘non-combustible’ or ‘of limited combustibility’ and may be used on buildings at any proximity to a boundary and the system is restricted for use in buildings up to 18 m in height.



8.5 In Scotland, the system is not classified as ‘non-combustible’ and may be used on buildings more than 1 m from a boundary and, on houses, 1 m or less from a boundary. With minor exceptions, the system should be included in calculations of unprotected area, except on houses where the external wall behind has the appropriate fire resistance.

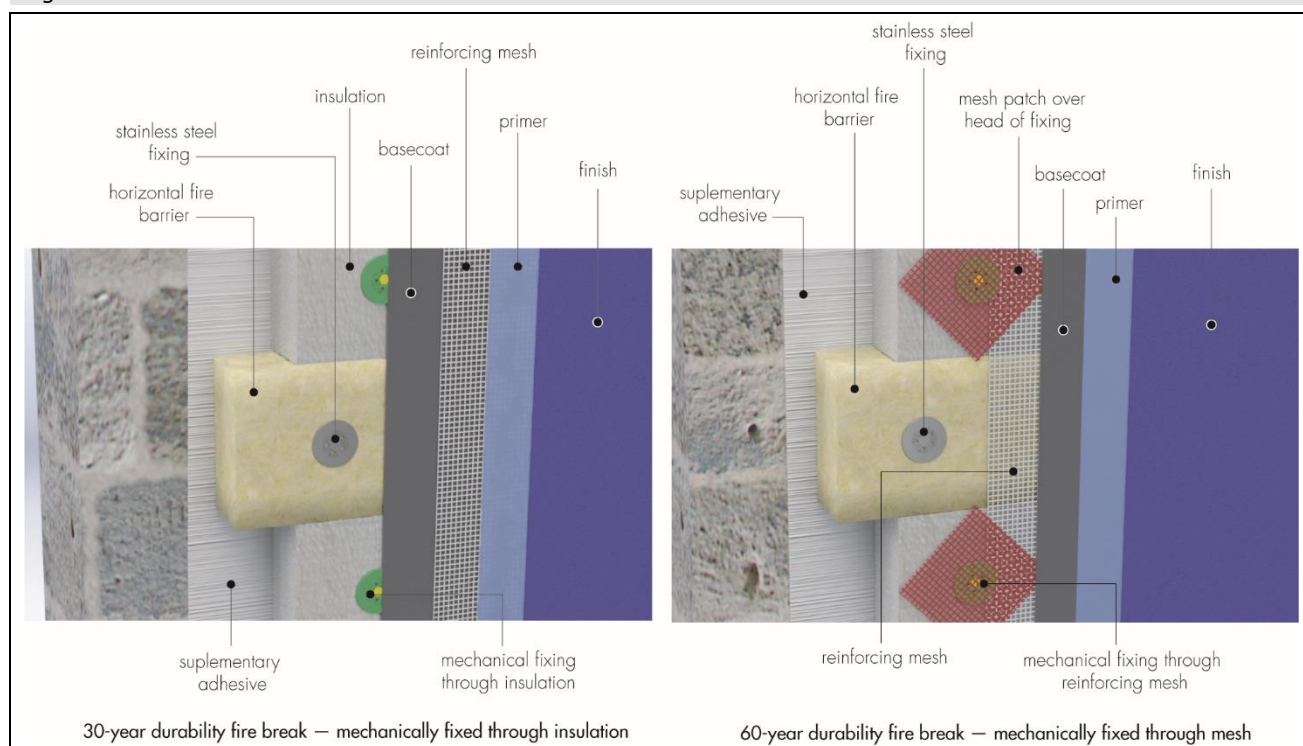
8.6 In Scotland, the system should not be used on any building with a storey more than 11 m above the ground, or on any entertainment or assembly building with a total storey area more than 500 m<sup>2</sup>, or on any hospital or residential care building with a total storey area more than 200 m<sup>2</sup>.

8.7 For application to second storey walls and above, it is recommended that the designer considers at least one stainless steel fixing per square metre, and fire barriers in line with compartment walls and floors as advised in BRE Report BR 135 : 2013 (see Figure 2 of this Certificate).

8.8 NHBC Standards require in all cases that a minimum of one non-combustible fixing through the reinforcement mesh, per square metre or per insulation board, whichever provides the greater number, should be provided, in addition to the other fixings.

8.9 Designers should refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for substrate fire performance, cavity barriers, service penetrations and combustibility limitations for other materials and components used in the overall wall construction.

Figure 2 Fire barrier details



## 9 Proximity of flues and appliances

When the system is installed in close proximity to certain flue pipes, the relevant provisions of the national Building Regulations should be met:

**England and Wales** — Approved Document J

**Scotland** — Mandatory Standard 3.19, clause 3.19.4<sup>(1)(2)</sup>

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

**Northern Ireland** — Technical Booklet L.

## 10 Water resistance



10.1 The system will provide a degree of protection against water ingress. However, care should be taken to ensure that walls are adequately watertight prior to application of the system. The system must only be installed where there is no sign of dampness on the inner surface of the substrate other than that caused solely by condensation.

10.2 Designers and installers should take particular care in detailing around openings, penetrations and movement joints to minimise the risk of water ingress.

10.3 The guidance given in BRE Report BR 262 : 2002 should be followed in connection with the watertightness of solid wall constructions. The designer should select a construction appropriate to the local wind-driven rain index, paying due regard to the design detailing, workmanship and materials to be used.

10.4 At the top of walls, the system should be protected by a coping, adequate overhang or other detail designed for use with this type of system (see section 16).

## 11 Risk of condensation

11.1 Designers must ensure that an appropriate condensation risk analysis has been carried out for all parts of the construction, including openings and penetrations at junctions between the insulation system, to minimise the risk of condensation. The recommendations of BS 5250 : 2011 should be followed.

### Surface condensation



11.2 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $0.7 \text{ W} \cdot \text{m}^{-2} \cdot \text{K}^{-1}$  at any point and the junctions with other elements and openings comply with section 6.3 of this Certificate.



11.3 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $1.2 \text{ W} \cdot \text{m}^{-2} \cdot \text{K}^{-1}$  at any point. Guidance may be obtained from BS 5250 : 2011, (Section 4 and Annex G) and BRE Report BR 262 : 2002.

### Interstitial condensation



11.4 Walls incorporating the system will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011 (Section 4, and Annexes D and G).

11.5 The water vapour resistance factors ( $\mu$ ) for the insulation, and the equivalent air layer thicknesses ( $S_d$ ) of the reinforced basecoat with finish coat, may be taken from Table 8, below.

Table 8 Water vapour resistance factors and equivalent air layer thickness<sup>(1)</sup>

| Render system                                                 | Equivalent air layer thickness $S_d$ (m) | Water vapour resistance ( $\mu$ ) |
|---------------------------------------------------------------|------------------------------------------|-----------------------------------|
| EPS insulation boards                                         | –                                        | 20 to 40 <sup>(2)</sup>           |
| RetroBase + Silicone acrylate render (both primer and finish) | 0.20                                     | –                                 |
| RetroBase + EnviroBrick render                                | 0.10                                     | –                                 |
| RetroBase + EnviroDash + Dry dash                             | 0.13                                     | –                                 |
| SpeedySlip adhesive                                           | 0.49                                     | 245                               |
| RetroBase (basecoat in isolation)                             | 0.08                                     | 16                                |
| SpeedySlips                                                   | 0.58                                     | 116                               |

(1) Taken from BS EN ISO 10456 : 2007, Table 4

(2) The value is taken from BS EN 12524 : 2000, Table 2.

## 12 Maintenance and repair



12.1 An initial inspection should be made within 12 months and regularly checked thereafter to include:

- visual inspection of the render for signs of damage. Cracks in the render exceeding 0.2 mm must be repaired
- examination of the sealant around openings and service entry points
- visual inspection of architectural details designed to shed water to confirm that they are performing properly
- visual inspection to ensure that water is not leaking from external downpipes or gutters; such leakage could penetrate the rendering
- necessary repairs effected immediately and the sealant joints at window and door frames replaced at regular intervals
- maintenance schedules, which should include the replacement and resealing of joints (for example, between the insulation systems and window and door frame).

12.2 For a 60-year durability, a detailed maintenance plan must be prepared and provided to the building manager/owner on completion. As a minimum, this should include an inspection for evidence of defects 12 months after the application and subsequently every five years. This plan should include full details of the required inspection regime; a record of these inspections should be retained.

12.3 Damaged areas must be repaired using the appropriate components and procedures detailed in the Certificate holder's installation instructions and in accordance with BS EN 13914-1 : 2016.

## 13 Durability



13.1 The system will remain effective for at least 30 years, provided any damage to the surface finish is repaired immediately and regular maintenance is undertaken, as described in section 12.

13.2 The system's service life can be extended to 60 years provided a planned inspection and maintenance programme is introduced, in accordance with section 12. A 60-years' service life requires the use of a stainless steel base, stop end and corner profiles, stainless steel fixings or centre pin Grade 1.4301 and plastic anchor sleeve material such as polyamide (PA6 and PA6.6), polyethylene (PE) or polypropylene (PP), and the following of an appropriate repair and maintenance schedule as covered by the Certificate holder's Repair and Maintenance Manual. In order to achieve this, and depending on the building's location, degree of exposure and detailing, it may be necessary to repair or replace isolated areas. Any damage to the surface finish must be repaired within a time period agreed in the Certificate holder's maintenance manual.

13.3 The render finish may become discoloured with time, the rate depending on the initial colour, the degree of exposure and atmospheric pollution, as well as the design and detailing of the wall. In common with traditional renders, discoloration by algae and lichens may occur in wet areas. The appearance may be restored by a suitable power wash or, if required, by over coating.

13.4 The renders incorporate Portland cement and may be subject to lime bloom. The occurrence of this may be reduced by avoiding application in winter or in adverse weather conditions. The effect is transient and is less noticeable on lighter colours.

13.5 To maintain a high-quality aesthetic appearance, it may be necessary to periodically overcoat the building using a suitable masonry coating (ie one covered by a valid BBA Certificate for this purpose). Care should be taken not to adversely affect the water vapour transmission or fire characteristics of the system. The advice of the Certificate holder should be sought as to the suitability of a particular product.

### 14 Site survey and preliminary work

14.1 A pre-installation survey of the property must be carried out to determine suitability for installation and the need for any necessary repairs to the building structure before application of the system. A specification must be prepared for each elevation of the building indicating:

- the position of beads
- detailing around windows, doors and at eaves
- damp-proof course (dpc) level
- exact position of expansion joints, if required
- additional corner mesh and reinforcement, where required
- areas where flexible sealants must be used
- any alterations to external plumbing
- the position of fire barriers.

14.2 The survey should include tests conducted on the walls of the building by the Certificate holder or their approved installers to determine the pull-out resistance of the proposed mechanical fixings. An assessment is carried out and recommendation made on the type and number of fixings required to withstand the building's expected wind loading based on calculations using the test data and pull-out resistance (see section 7). The advice of the Certificate holder should be sought to ensure the proposed bonding pattern (supplementary adhesive) is sufficient.

14.3 All modifications, such as provision for fire barriers (see section 8) and necessary repairs to the building structure, must be completed before installation of the system commences.

14.4 Surfaces should be sound, clean and free from loose material. The flatness of surfaces must be checked; this may be achieved using a straight-edge tool spanning the storey height. Any excessive irregularities, ie greater than 10 mm in one metre, must be made good prior to installation, to ensure that the insulation boards are installed with a smooth, in-plane finished surface.

14.5 Where surfaces are covered with an existing rendering, it is essential that the bond between the background and the render is adequate. All loose areas should be hacked off and reinstated.

14.6 On existing buildings, purpose-made window sills must be fitted to extend beyond the finished face of the system. New buildings should incorporate suitably deep sills.

14.7 In new buildings, internal wet work (eg screed or plastering) should be completed and allowed to dry prior to the application of the system.

14.8 All modifications and necessary repairs to the building structure should be completed before installation commences.

14.9 In multi-storey buildings, at least one non-combustible type fixing per square metre is recommended, to provide the increased stability that may be required in a fire (see section 8.7).

### 15 Approved Installers

Application of the system, within the context of this Certificate, must be carried out by approved installers recommended or recognised by the Certificate holder. Such an installer is a company:

- employing operatives who have been trained and approved by the Certificate holder to install the system
- which has undertaken to comply with the Certificate holder's application procedure, containing the requirement for each application team to include at least one member-operative trained by the Certificate holder
- subject to at least one inspection per annum by the Certificate holder to ensure suitable site practices are being employed. This may include unannounced site inspections.

## 16 Procedure

### General

16.1 Installation of the system must be carried out in accordance with the Certificate holder's installation instructions.

16.2 Weather conditions should be monitored to ensure correct application and curing conditions. Application of coating materials must not be carried out at temperatures below 5°C or above 30°C, or if exposure to frost is likely, and the coating must be protected from rapid drying. Installation should not take place during rainfall or if rain is anticipated. In addition, cementitious-based renders must not be applied if the temperature will fall below 0°C within 72 hours of completion.

16.3 The planarity of the substrate must be checked, and any protrusions exceeding 10 mm removed.

16.4 If using the silicone acrylate render, the primer should be used (see section 1.3).

16.5 All rendering should be in accordance with the relevant recommendations of BS EN 13914-1 : 2016.

16.6 At the tops of walls, the system must be protected by an adequate overhang or by an adequately sealed, purpose-made flashing.

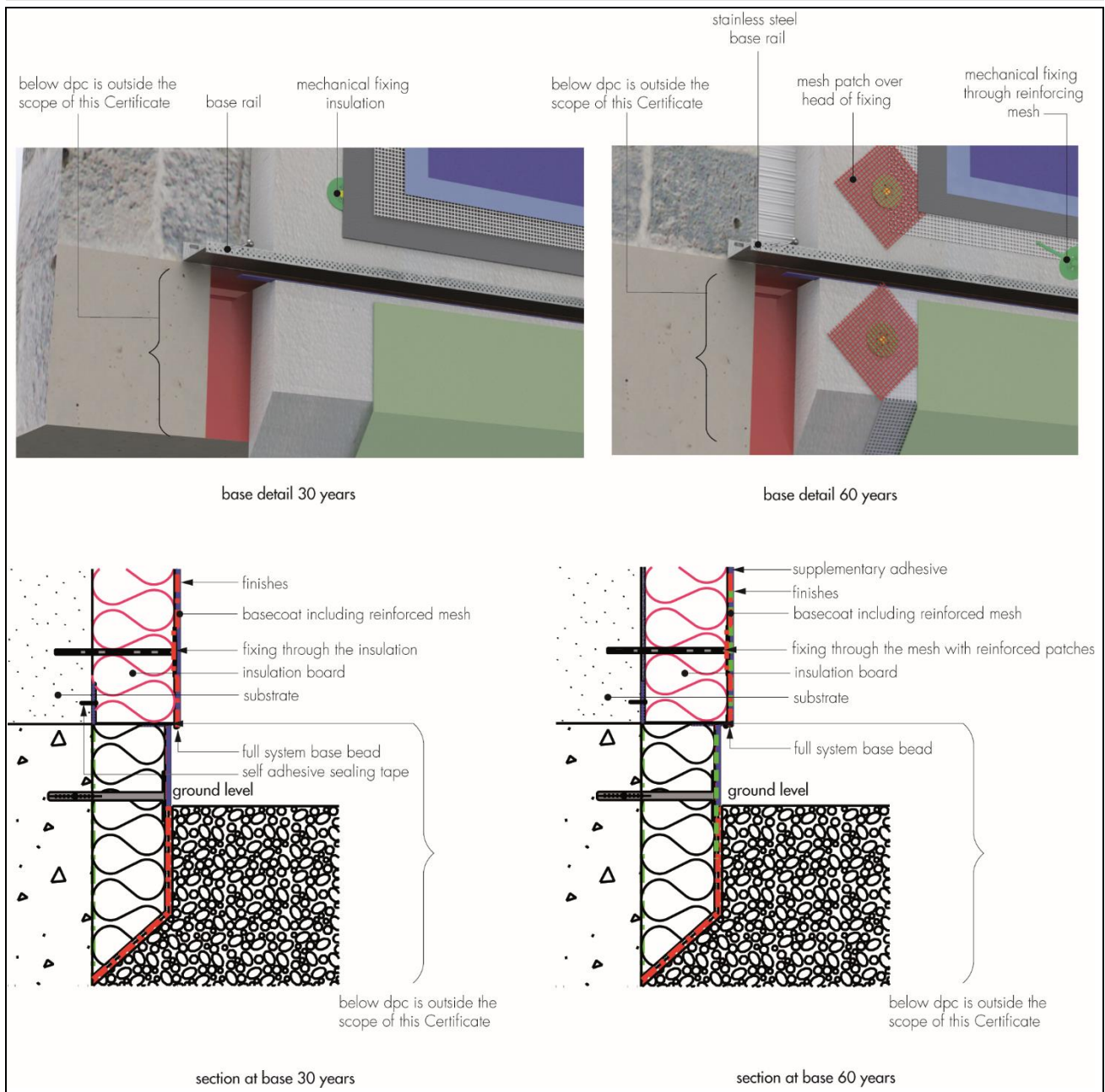
16.7 Care must be taken in the detailing of the system around openings and projections (see Figures 9, 10 and 11). To achieve a 60-year service life, the system is finished against a stainless steel stop bead at reveals, to allow for replacement of windows.

16.8 The difference between 30- and 60-year durability systems is described in section 1 of this Certificate. The initial installation procedure is common to both systems and is described in sections 16.9 to 16.19 of this Certificate.

### Positioning and securing insulation boards

16.9 The base profile is secured to the external wall above the dpc using the approved profile fixings at approximately 300 mm centres. Base profile connectors are inserted at all rail joints. Extension profiles are fixed to the front lip of the base profile or stop end channel where appropriate. Beads and expansion joints are incorporated as specified.

**Figure 3 Typical section of base profile**

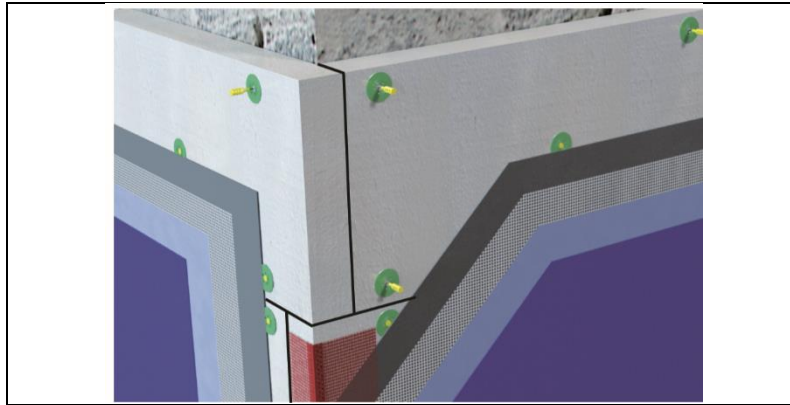


16.10 The adhesive is prepared by mixing each bag with the required amount of clean water in a suitable container using a paddle drill mixer to create a paste-like mortar in accordance with the Certificate holder's instructions (see section 1.5).

16.11 The adhesive is applied in a continuous line around the perimeter of the insulation board (at least 30 mm wide) with at least six additional dabs of adhesive (approximately 80 to 120 mm in diameter) distributed uniformly over the remaining surface in order to achieve a minimum 40% coverage. Alternatively, for even and smooth substrates, the whole board can be coated with adhesive using a notched trowel. The thickness to be achieved for both methods is 10 mm. The board should be immediately placed on the substrate and pressed into place.

16.12 The first run of insulation boards is positioned on the base profile, pressed firmly against the wall and butted tightly together, with the vertical joints staggered by at least 200 mm. Subsequent rows of boards are positioned so that the vertical joints are staggered and overlapped at the building corners (see Figure 4), and so that board joints do not occur within 200 mm of the corners of openings. Between boards, joints greater than 2 mm should be filled with slivers of insulation or PU foam. Gaps greater than 10 mm should be closed by repositioning or, where appropriate, by cutting boards to fit. Alignment should be checked as work proceeds.

*Figure 4 Typical arrangement of insulation boards at external corners*



16.13 One mechanical fixing is applied through each insulation board to secure boards initially.

16.14 Periodic checks should be carried out during the installation. Where existing render is on the wall or dubbing out render has been used, care should be taken when aligning the boards as the effective embedment will be reduced.

16.15 To fit around details such as doors and windows, the boards may be cut with a sharp knife or a fine-tooth saw. Purpose-made powder-coated aluminium window sills (complete with sill end caps) are installed in accordance with the Certificate holder's instructions. They are designed to prevent water ingress and incorporate drips to shed water clear of the system, but their performance is outside the scope of this Certificate.

16.16 Any high spots should be removed by lightly planing with a rasp. The surface of the boards should be smooth. At all locations where there is a risk of insulant exposure (eg window reveals or eaves), the system must be protected (eg by an adequate overhang or by purpose made sub-sills, seals or flashing).

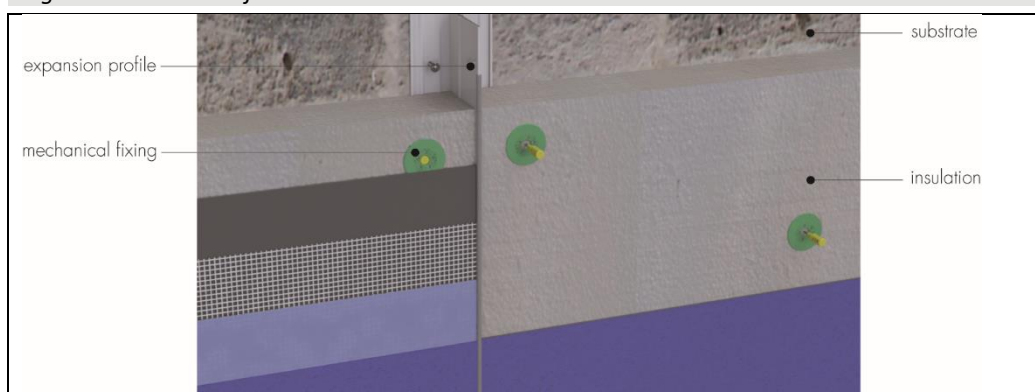
16.17 For a 60-year durability system, any portion of the corner profile that remains exposed after the application of the finish coat must be constructed from stainless steel.

16.18 Installation continues until the whole wall is completely covered including, where appropriate, the building soffits.

### **Movement joints**

16.19 Generally, movement joints are not required in the system but, if an expansion joint is already incorporated in the substrate, a movement joint must be included with the system (see Figure 5).

*Figure 5 Movement joint detail*



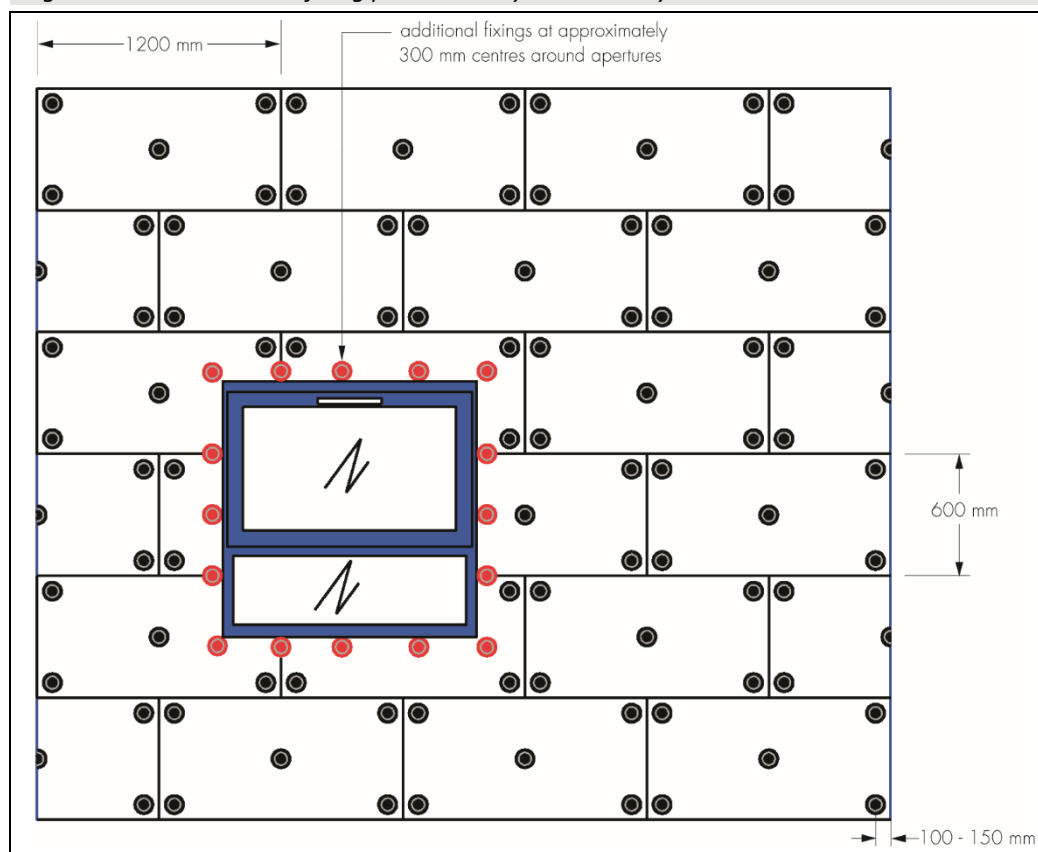
### **Application of 30-year durability systems (mechanical fixings through the insulation boards)**

16.20 After the boards are in place and the insulation adhesive has set, mechanical fixings are applied.

16.21 Holes are drilled through the insulation into the substrate to the required depth equidistantly at the corners of each board and at positions which will allow a minimum of five fixings per board (seven fixings per square metre) – see Figure 6). Around openings, additional fixings should be used at 300 mm centres. The mechanical fixings are inserted

and tapped or screwed firmly into place. The system is then ready for the application of basecoat (mixed as described in section 1.5).

**Figure 6** *Insulation board fixing pattern – 30-year durability*



16.22 The basecoat is applied progressively over the insulation boards, using a notched trowel and floated with a Darby float to an approximate minimum thickness of 4 mm.

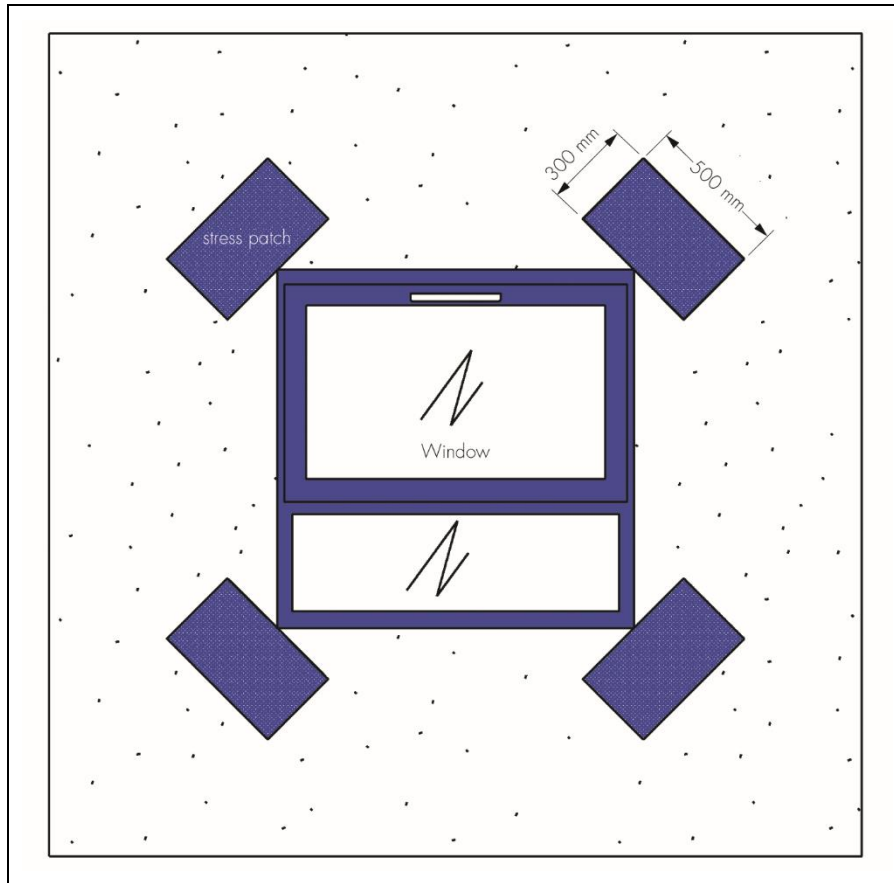
16.23 Reinforcement mesh is immediately applied and embedded into the basecoat using the trowel, and overlapped at all mesh joints by not less than 100 mm; a further layer of basecoat is applied and smoothed-off to remove trowel lines. The overall thickness should be a minimum of 5 mm.

16.24 It is important to ensure that the mesh is free of wrinkles, completely covered and the required minimum thickness of basecoat is achieved.

16.25 Additional pieces of reinforcing mesh, 300 by 500 mm, are used diagonally at the corners of openings, as shown in Figure 7.

16.26 Building corners, door and window heads and jambs are formed using mesh corner profiles, bonded to the insulation in accordance with the Certificate holder's instructions.

*Figure 7 Additional reinforcement at openings*



16.27 The system is then ready for the application of a decorative coat.

**Application of 60-year durability system (mechanical fixings through the reinforcement mesh)**

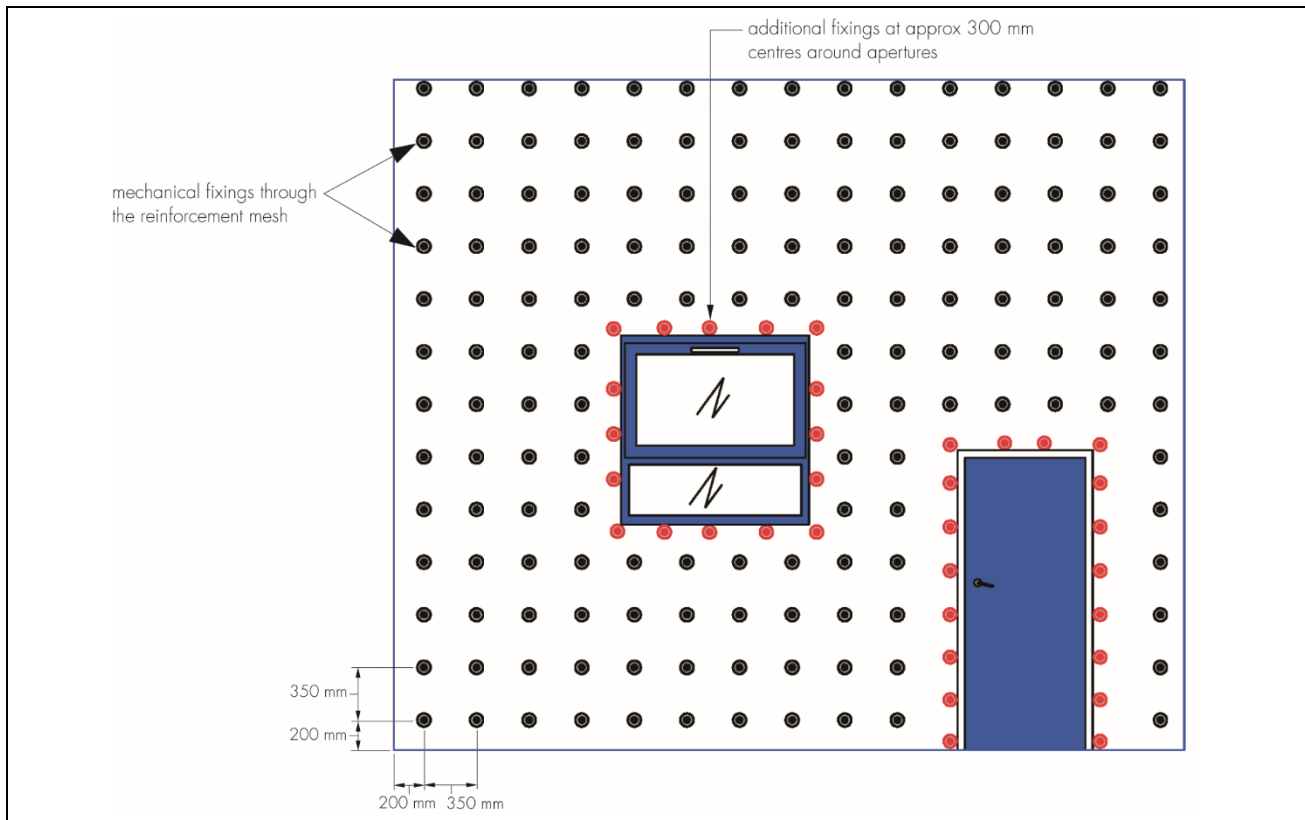
16.28 After the insulation adhesive has set, the system is ready for the application of basecoat (mixed as described in section 1.5).

16.29 The basecoat is applied progressively to an approximate thickness of 5 mm over the insulation boards, working in 1 m sections in vertical and horizontal directions, using a stainless steel trowel.

16.30 The reinforcement mesh is applied and immediately embedded, overlapping at joints by at least 100 mm. Further basecoat is then applied as required, to ensure the mesh is completely covered and the required minimum thickness of basecoat is achieved (5 mm in total).

16.31 Mechanical fixings (at the rate of 7 fixings per m<sup>2</sup>) are applied through the mesh and the insulation boards while the basecoat is still wet using the fixing pattern provided by the Certificate holder (see Figure 8 for the fixing pattern). Holes are drilled through (into the substrate wall) and mechanical fixings are inserted and tapped or screwed firmly into place. The fixing head is deliberately over-driven into the insulation to reduce the protrusion of the fixing head on the surface of insulation board.

**Figure 8 Insulation board fixing pattern – 60-year durability**



16.32 While the basecoat is still wet, 300 by 300 mm stress patches of reinforcing mesh are applied over the mechanical fixing heads and fully embedded within the basecoat. Further basecoat is used (if required), in order to achieve a 4 mm thickness (approximately), when measured from the top of the fixings.

#### **Decorative finishes (30- and 60-year systems)**

16.33 When required, the silicone acrylate primer is used (of an appropriate colour to match the finish coat) which should be thoroughly mixed and applied by roller to the entire area.

##### *Dash aggregate finish*

16.34 The EnviroDash dash receiver is prepared and trowel-applied to a thickness of approximately 6 to 8 mm. While the render is still soft, clean spar aggregate is thrown or sprayed onto the surface. On completion, the surface must be checked to ensure an even coverage of spar-dash has been achieved. Where necessary, the aggregate should be lightly tamped to ensure that a good bond is achieved.

16.35 Continuous surfaces must be completed without a break.

##### *Brickslip finish*

16.36 SpeedySlip adhesive mortar is trowelled onto the surface of the basecoat and the surface is roughened with a notched trowel or comb. The direction of the notched lines of the adhesive mortar must be perpendicular to the brickslip length.

16.37 The SpeedySlips are laid by pressing onto the surface of the adhesive, ensuring a firm bond is achieved. Pointing between the brick-slips is carried out using a wet soft brush.

##### *Render finish*

16.38 The silicone acrylate render finish coat is applied over the silicone acrylate primer to a thickness dictated by the grain size. A straight edge can be used to help ensure a flat surface, and specialised tools supplied by the Certificate holder can be used to create the desired finish.

16.39 The silicone acrylate render finish coats are applied using a stainless steel trowel and float, and finished with a plastic float to create the required finish texture.

16.40 Continuous surfaces must be completed without a break.

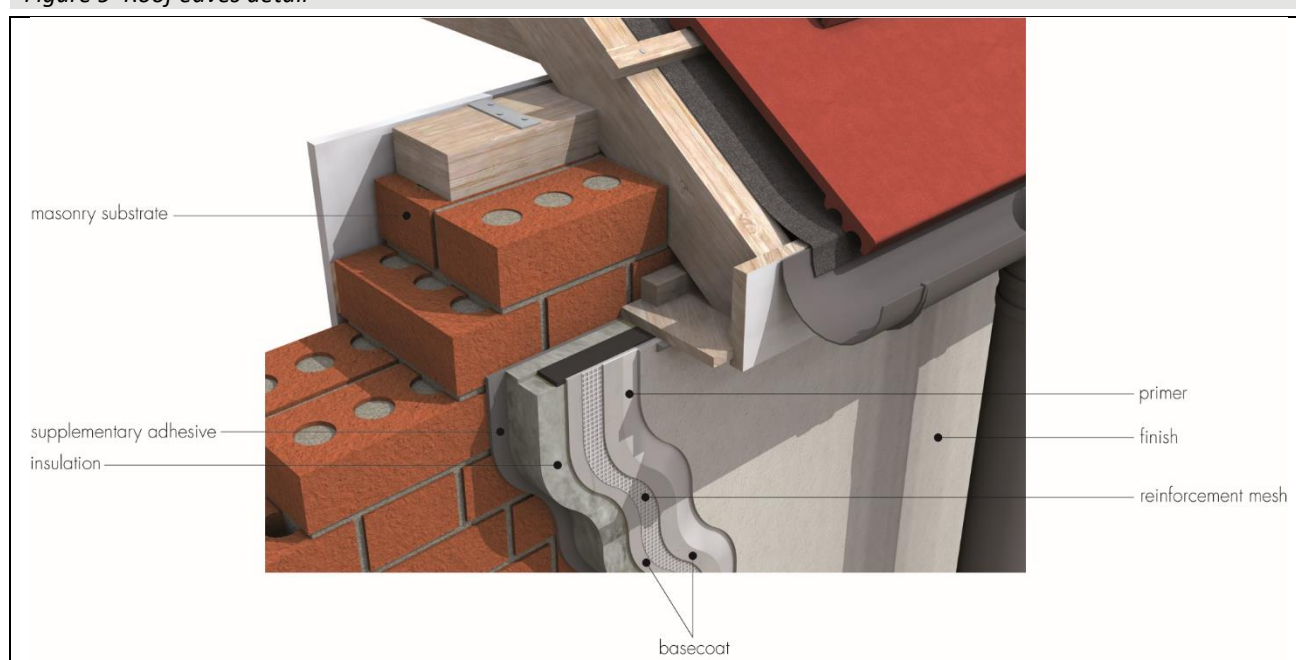
#### *Brick render finish*

16.41 For EnviroBrick render applications, the first layer of EnviroBrick is applied over the completed basecoat to a uniform thickness using a stainless steel trowel and floated off. At the precise level of cure, the second layer is applied to the whole surface and a selected brickwork bonding pattern is formed by careful cutting out of the surface layer to expose the visual 'mortar' layer beneath. The total applied thickness is 11 mm.

16.42 Continuous surfaces must be completed without a break.

16.43 On completion of the installation, external fittings, eg rainwater goods, are re-fixed through the system into the substrate in accordance with the Certificate holder's instructions.

*Figure 9 Roof eaves detail*



*Figure 10 Typical window reveal detail – example 1*

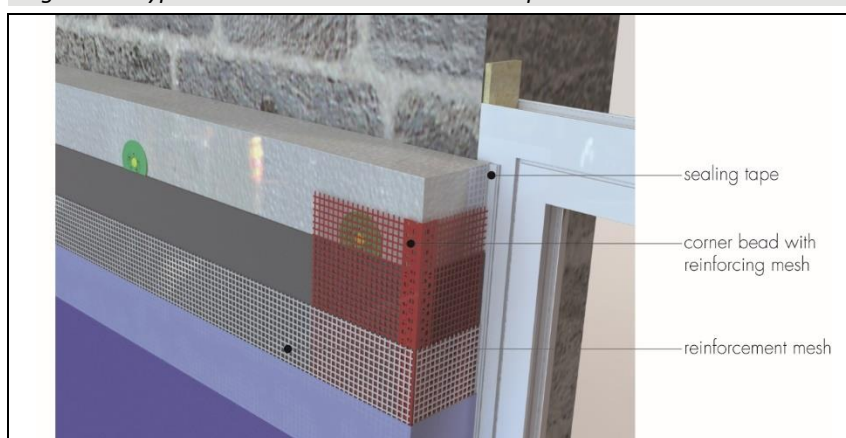
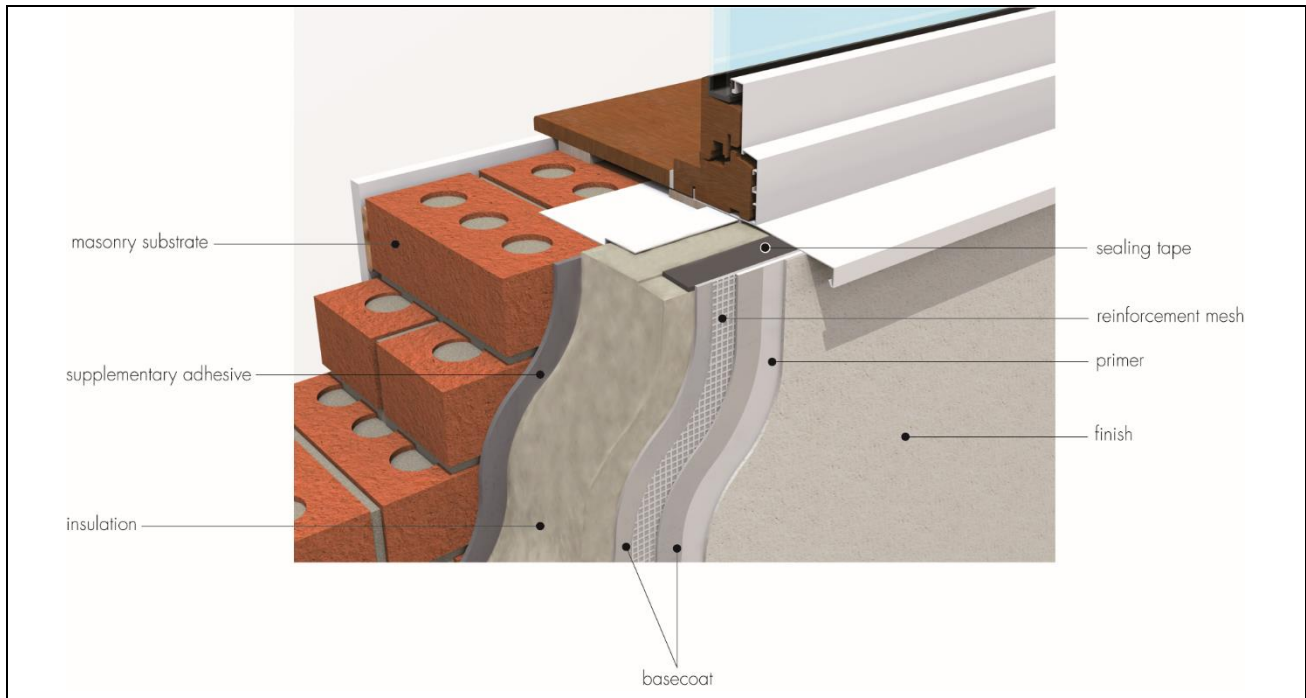


Figure 11 Typical window reveal detail – example 2



## Technical Investigations

### 17 Investigations

17.1 The system was examined and assessed to determine:

- fire performance
- bond strength
- hygrothermal performance
- resistance to frost
- resistance to hard body impact
- water absorption of render
- water vapour permeability
- durability.

17.2 An examination was made of data relating to:

- reaction to fire
- thermal conductivity
- the risk of interstitial condensation.

17.3 The practicability of installation and the effectiveness of detailing techniques were examined.

17.4 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of materials used.

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